

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Yoshikazu KAWAGOE et al.

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Examiner Devang R. PATEL
Confirmation No.: 5078

For: SOLAR BATTERY MODULE PRODUCTION METHOD AND SOLAR
BATTERY MODULE PRODUCTION APPARATUS

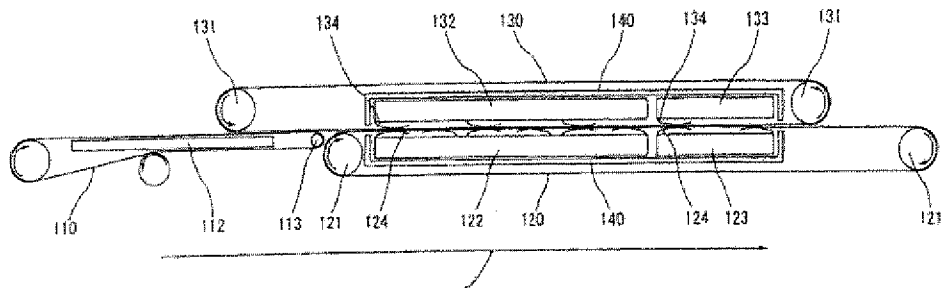
May 3, 2010

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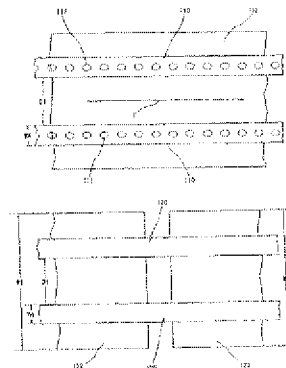
PRE-APPEAL BRIEF REQUEST FOR REVIEW

Applicants request pre-appeal review of the final rejections made in the February 3, 2010 Final Office Action (hereinafter "FOA"). An aspect of the present invention is directed toward a solar battery module production method utilizing a production apparatus. The solar battery module is produced by electrically connecting a plurality of solar battery cells to one another by interconnectors. The battery cells are serially connected (bottom of one cell connected to top of next cell) by the elongated interconnectors. Fig. 1 (see below) illustrates an example production apparatus for use in the production of the solar battery module.



So that the battery cells 10 and the interconnectors 20 are properly positioned and transported, the positioning belt 110 includes vacuum suction holes 111 aligned in the transport direction F as illustrated in Fig. 2 (see right top). *Specification, p.16, ll.9-14.*

But unlike the positioning belt 110, the heating belt 120 has no such vacuum holes as illustrated in Fig. 3 (see right bottom). This is because the suction holes can get clogged by the melted solder in the soldering. *Specification, p.20, ll.4-10.*



During production, a robot (not shown) can place the battery cells and the interconnectors on the positioning belt 110 in proper positional relation upstream of the positioning belt 110. *Specification, p.16, ll.5-8.* The positioning belt 110 positions and transports the battery cells and the interconnectors to the adjacently placed heating belt 120. The press belt 130 extends over both the positioning belt 110 and the heating belt 120, and functions to press the battery cells and the interconnectors as they are transferred from the positioning belt 110 to the heating belt 120. The press belt 130 also functions to press the battery cells 10 and the interconnectors 20 as they are soldered while being transported on the heating belt 120. *Specification, p.15, l.20 – p.16, l.3.*

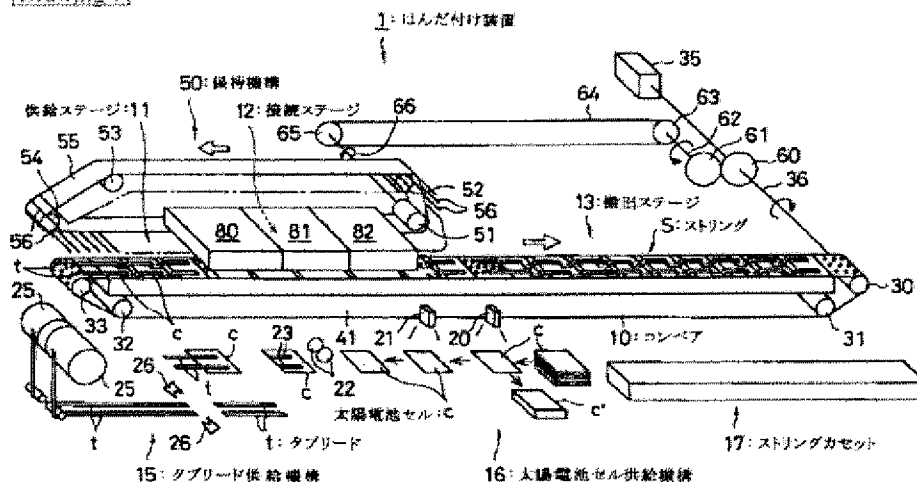
REJECTIONS CLEARLY ERRONEOUS

Claims 1-4 stand rejected as being unpatentable over JP 2000-022188A (hereinafter JP'188) in view of Kannegiesser et al (US 6,309,506) (hereinafter US'506), Toyama (JP 11278626A), and in further view of Garbini et al (US 3,883,386) (hereinafter US'386). *FOA, pp.2-6.* Independent claim 1 is directed to a production method for a solar battery module and recites, in part:

utilizing a production apparatus including a positioning belt and a heating belt located adjacent each other in a transferable manner and a press belt extending over the positioning belt and the heating belt in opposed relation to the positioning belt and the heating belt such that the press belt overlaps at least a portion of the positioning belt, the positioning belt having a vacuum suction hole, and the heating belt having no suction hole, and adapted to control the heating belt and the press belt at predetermined temperatures.

In the Office Action, JP'188 is primarily relied upon to allegedly disclose the claimed features. For convenience, figure 1 of JP'188 is reproduced below.

[Drawing 1]

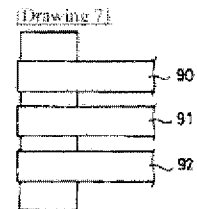


The soldering equipment 1 includes a conveyor 10 that conveys photovoltaic cell c and tab lead t rightward in the figure. The conveyor 10, which can be formed of a steel belt (*JP'188, [0036]*), is divided into multiple stages where specific actions are performed within each stage. At the left of the conveyor 10 is the supply stage 11 where the cell c and the tab t are positioned (*JP'188 [0015]*). The tab t and the cell c are fed by the tab lead feed mechanism 15 and the cell feed mechanism 16 (*JP'188 [0016 - 0019]*). From the supply stage 11, the cells and tabs are

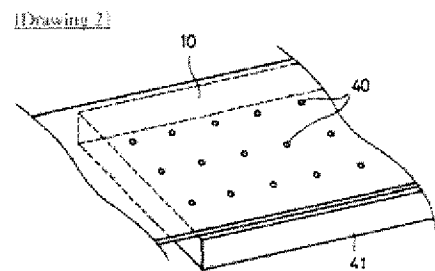
transported to the connection stage 12 which electrically connects the tab to the cell (*JP'188 [0015]*) to form a string *s* by soldering. In the taking-out stage 13, the formed string *s* is transported in the down stream (right) direction (*JP'188 [0015]*).

Examiner alleges that *JP'188* discloses an unillustrated conveyance mechanism, an endless belt 55, and belts 90/91/92, which are respectively equivalent to the claimed positioning belt, press belt, and the heating belt respectively (*FOA para 1.a.i, p.2*).

Regarding the belts 90/91/92, *JP'188* is clear that the conveyor belt 10 can be divided into multiple belts 90/91/92 as illustrated in figure 7 (see right) instead of a single belt (*JP'188 [0037]*). That is, the multiple belts 90/91/92 in figure 7 make up the conveyor belt 10 in figure 1. Thus, the Examiner is alleging that the conveyor belt 10 is equivalent to the claimed heating belt.



Regarding the conveyor belt 10, *JP'188* provides a detailed illustration in figure 2 (see right). *JP'188* is clear that inspiratory ports 40 are established on the surface of the conveyor 10, and air is inhaled from the inspiratory ports 40 by decompression operation of an air supply chamber 41. In this way, the cell *c* carried in the supply stage 11, the connection stage 12, and the taking-out stage 13 is adsorbed on the conveyor 10 (*JP'188, [0021]*).



Claim 1 recites that the heating belt has no suction holes. Examiner alleges that *JP'188* discloses the heating belts 90/91/92 as having no suction holes (*FOA p.2*). *JP'188* itself makes no indication one way or the other whether the belts 90/91/92 have the inspiratory ports. Thus, figure 7 is the only basis on which the Examiner makes such allegation. A closer reading of *JP'188* makes clear that figure 7 is not intended to illustrate details of the belts 90/91/92. Rather, figure 7 is merely intended to show that the conveyor belt 10 can be provided as three belts 90/91/92 (*JP'188 [0036 - 0037]*). Thus, figure 7 cannot be taken to suggest that the belts lack suction ports.

Indeed, the suggestion is quite. That is, the suggestion is that the belts 90/91/92 do include the inspiratory ports. Without the ports, the cell *c* cannot be adsorbed on to the conveyor 10 – whether it be a single belt or multiple belts – as the cell *c* is transported through the supply, the connection, and the taking-out stages 11, 12, 13 (*JP'188 [0021]*). To maintain the adsorption, the belts 90/91/92 must include the suction holes. This is diametrically opposed to the claimed feature. No other reference is relied upon to teach or suggest this feature. For this reason alone, claim 1 is distinguishable over the cited references.

But in addition, the conveyance mechanism and the conveyor 10 – alleged to be equivalent to the claimed positioning and heating belt – are one and the same. *JP'188* unequivocally states “This soldering equipment is equipped with the conveyor 10 as a conveyance mechanism” (*JP'188 [0015]*). Since they are one and the same, *JP'188* cannot show both the positioning belt and heating belt.

Despite this demonstration, Examiner alleges that *JP'188* discloses both, but the explanation is that the conveyance mechanism is simply not illustrated. For support, Examiner

relies upon JP'188 [0019] to demonstrate that the disclosed conveyance mechanism is disclosed, but not illustrated (*Advisory Action of 2/27/09*). The paragraph is reproduced in its entirety:

Moreover, photovoltaic cell c in the state where positioned the tab lead t on the surface in this way, and it was carried by the conveyance mechanism equipped with the adsorption pad etc. which is not illustrated is carried on the conveyor 10 in the supply stage 11.

The paragraph indicates that the unillustrated "thing" is carried on the conveyor 10. The thing being carried on the conveyor is the photovoltaic cell c in a state where the tab lead t is positioned on the surface "in this way". The way the cell c and tab t are positioned is described in the preceding paragraph [0018]. Thus, what is not illustrated is the particular manner in which the cells and tabs are positioned.

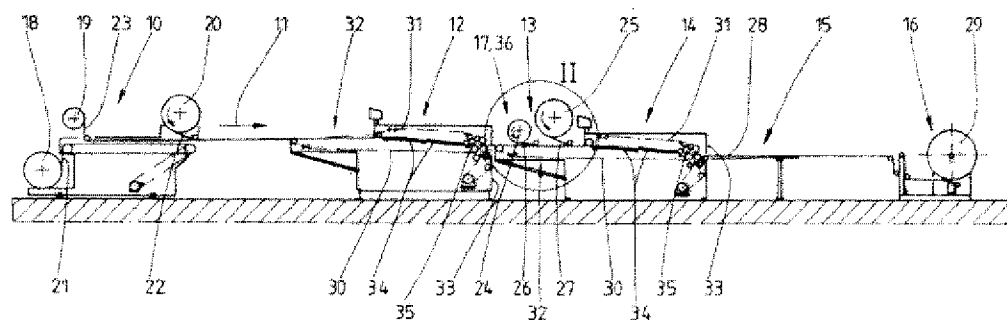
Examiner also points to JP'188 [0029] which states "And photovoltaic cell c in the state where positioned the tab lead t on the surface and it was carried by the conveyance mechanism which is not illustrated is carried on a conveyor 10 on the supply stage 11." While one interpretation can be that the conveyance mechanism is not illustrated, a more likely and accurate interpretation is that the state of the photovoltaic cell c is not illustrated as demonstrated with respect to [0019].

Note also that the difference between the two interpretations of [0029] is that Examiner's interpretation makes JP'188 self-contradictory, while the other interpretation does not.

Even if it is assumed that JP'188 does disclose an unillustrated conveyance mechanism, Examiner still does not demonstrate that the conveyance mechanism and the conveyor 10 are located adjacent each other in a transferable manner. Indeed, there is no demonstration that the conveyance mechanism is even a belt at all.

Claim 1 further recites that the press belt overlaps at least a portion of the positioning belt. Examiner correctly notes that JP'188 does not disclose this feature, but relies upon US'506, which is directed to joining flexible surface structures by gluing. This is completely inanalagous to the claimed invention and to JP'188. The photovoltaic cells c and tabs t are not flexible and the two are not joined through gluing. Thus, the teachings of US'506 are inapplicable to JP'188 and the two references cannot be combined.

On US'506 itself, the Examiner alleges that belts 30 and 31 are equivalent to the claimed positioning and pressing belts. Fig.1 of US'506 is reproduced below.



Note that the belt 30 runs from the feed side 32 to the run out side 33 of the laminating device 12. Within the laminating device 12, heating devices 34 are provided which heat and join

the surface structures 21, 22, and 23 (*US'506, c. 7, ll.10-19*). As such, the belt 30 may at best correspond to the heating belt. But it does not correspond to the positioning belt. Since the belt 31 only overlaps the belt 30, *US'506* cannot disclose the press belt overlapping the positioning belt even if it is mistakenly assumed that *US'506* is applicable.

Yet further, Examiner correctly notes that *JP'188* does not disclose the positioning belt having vacuum suction holes, but relies upon *Toyama* to allege that such technique is well known, and thus, it would be obvious to modify the positioning belt since *Toyama* teaches the holes being provided on the conveying belt keep the substrate vacuum fixed, inhibits deviation of the substrate position, and thus transfer operation is performed efficiently.

The same logic applies to the heating belt as well since the substrate must also be conveyed while on the heating belt. None of the references indicate otherwise. Thus, if one of ordinary skill would apply *Toyama's* teaching as the Examiner alleges, then one of ordinary skill would also apply the teachings to the heating belt as well. However, providing the suction holes completely teaches away from the claimed feature in which the heating belt has no belt suction holes.

For at least the reasons stated above, independent claim 1 is distinguishable over all applied references, and the rejection of claim 1 is clearly erroneous. For similar reasons, the rejection of claim 3 is also clearly erroneous. Rejections of claims 2 and 4-12 are clearly erroneous by virtue of their dependencies from claims 1 and 3, as well as on their own merits.

CONCLUSION

As shown by the above analysis of the references, there is no disclosure of the claimed subject matter in the prior art, nor is the claimed subject matter rendered obvious in view of the prior art. The prior art rejections should be withdrawn, and the pending claims allowed.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____


Hyung N. Sohn
Reg. No. 44,346

HNS/edg
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100